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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/611,805	06/30/2003	Lizhong Sun	AMAT/6877/CMP/CMP/RKK	5060

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EXAMINER

BIRENBAUM, NIRA S

ART UNIT	PAPER NUMBER
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1742

DATE MAILED: 07/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/611,805

Applicant(s)

SUN ET AL.

Examiner

Nira S. Birenbaum, Ph.D.

Art Unit

1742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 January 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 11-13-2003.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Sun *et al.* (US Patent No. 6,299,741).

The applied reference has a common inventor with the instant application.

Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Sun *et al.* teach a method for electrochemical mechanical planarization comprising:

- providing a basin (tank 50) containing an electrically conductive solution (55) and an electrode disposed therein (65),
- disposing a polishing medium (pad 105) in the electrically conductive solution,

Art Unit: 1742

- positioning a substrate (**10**) against the polishing medium so that a surface of the substrate contacts the solution (see Figures 2 and 3),
- applying a first potential for a first time period and applying a second potential for a second time period (column 2, lines 48-60).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-10 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uzoh *et al.* (US Patent No 5,807,165) in view of Lewy (US Patent No. 5,135,625).

Regarding claim 1, Uzoh *et al.* teach a method for electrochemical mechanical planarization comprising:

- disposing a polishing medium (pad **64**) in an electrically conductive solution (slurry **74**),
- positioning a substrate (wafer **W**) against the polishing medium so that a surface of the substrate contacts the solution (see Figures 7 and 11a),
- applying a first potential for a first time period and applying a second potential for a second time period (see Figure 14).

However, Uzoh does not teach a basin containing the electrically conductive solution and an electrode disposed therein.

Lewy teaches a method for electrochemical planarization in which the electrode and electrolyte are held in a container (**10**, see Figure 1). It would have been obvious to

Art Unit: 1742

one of ordinary skill in the art at the time of the invention to modify the method of Uzoh *et al.* by incorporating a basin or container as disclosed by Lewy, in order to allow for circulation of the electrolyte solution as taught by Lewy (column 3, lines 39-64).

Regarding claims 2 and 3, Uzoh *et al.* teach that the second potential may be zero and may be lower than the first potential (see Figure 14a, note that zero applied current would correspond to zero applied potential).

Regarding claims 4-7, a pulsed potential sequence would inherently have a waveform, such as a square wave (see Figure 14). Further, regarding claim 6, Uzoh *et al.* teach that the second potential can be negative (see Figure 14b).

Regarding claims 8 and 9, Uzoh *et al.* teach the first and second potentials can be modulated within a predefined range of potentials (see Figure 14d).

Regarding claim 10, Uzoh *et al.* teach that the pulses can be repeated a number of times (see Figure 14).

Regarding claim 15, Uzoh *et al.* teach that the first time period can be greater than the second time period (see Figure 14b).

Claims 11-14 and 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uzoh *et al.* in view of Lewy as applied to claim 1 above, further in view of Kuwabara *et al.* (US Patent No. 4,956,060).

Uzoh *et al.* and Lewy teach the features as previously described. However, regarding claims 11, 13, and 16, these references do not teach applying a third potential for a third period of time and a fourth potential for a fourth period of time.

Kuwabara *et al.* teach an electrochemical finishing method which involves applying a pulsed current to the substrate. As many as four different pulse potentials are taught (see column 14, examples 1 and 2, and claim 8). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Uzoh *et al.* in view of Lewy by applying a third and fourth pulsed potential as disclosed by Kuwabara *et al.*, because Kuwabara *et al.* teach that this technique enables the complete removal of an oxide layer from a three-dimensional surface, resulting in a higher-quality surface (column 2, lines 33-44).

Regarding claims 12, 14, 17, and 18, a pulsed potential sequence would inherently have a waveform.

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Uzoh *et al.* in view of Lewy as applied to claim 1 above, further in view of Kilcher *et al.* (US Patent No. 4,655,888).

Uzoh *et al.* and Lewy teach the features as previously described. However, these references do not teach applying a third potential and repeating the steps of applying a first, second and third potential.

Kilcher *et al.* teach a method for electro-eroding a workpiece comprising applying a pulsed current, wherein the pulse sequence can be composed of three successive pulses of different amplitudes and the sequence is repeated a number of times (see Figure 2d). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Uzoh *et al.* in view of Lewy by using the pulse

Art Unit: 1742

sequence of Kilcher *et al.*, because Kilcher *et al.* teach that this technique can result in a workpiece with uniform surface quality (column 2, lines 6-9).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nira S. Birenbaum, Ph.D. whose telephone number is (571) 272-8516. The examiner can normally be reached on M-F 8:00 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

nsb


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SUPERVISORY PATENT EXAMINER
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